

succeeded to the chair of astronomy, and his lectures and teaching were necessarily more limited.

Prof Joly will be best remembered by his loyalty to the memory of Sir William Hamilton, of whose "Manual of Quaternions" he prepared a new edition. He endeavoured to promote the study of this branch of mathematics in various ways, by his original writings, in which he sought to bring projective geometry within this special method of treatment, and by the support he gave to the International Association for Promoting the Study of Quaternions and Allied Systems of Mathematics. We are also indebted to him for the third edition of Preston's "Theory of Light," while many papers in the *Transactions of the Royal Irish Academy* testify to his industry and power.

Prof. Joly was elected a Fellow of the Royal Society in 1904; he acted as secretary to the Royal Irish Academy from 1902, and was a member of many learned societies. He was a delightful companion, with a memory well stored with anecdotes of Hamilton, of Airy, of Robinson, and many another worthy; as a teacher he had the power of interesting his class and awakening their energies, and all too soon he is removed from a circle which he loved, and a society that his abilities adorned. W. E. P.

NOTES.

SIR MOUNTSTUART E. GRANT-DUFF, G.C.S.I., F.R.S., who died in London on Thursday, January 11, at seventy-six years of age, will long be remembered by his "Notes from a Diary"—a series of fourteen volumes full of chatty reminiscences extending from January, 1851, to January, 1901. Many distinguished men of science, both at home and abroad, were met by the author during this period of fifty years, and in each of the volumes of his diary are preserved interesting anecdotes and pithy remarks made by his acquaintances in the scientific world. Sir Mountstuart was fond of natural history, and particularly of botany, to which he devoted much attention. The 117th volume of the *Botanical Magazine* was dedicated to him by Sir Joseph Hooker "as a slight acknowledgment of the valuable services which you rendered to botany and horticulture when Under-Secretary of State, first for India and then for the Colonies, and lately when Governor of the Madras Presidency." He was president of the Royal Geographical Society from 1889 to 1893, and a member of the Senate of the University of London in 1891. By his spirit of investigation and sympathetic interest in scientific work—attributes not possessed by many statesmen—Sir Mountstuart secured the kindly feelings of all who are concerned with the study of nature.

WE regret to see the announcement that Dr. H. J. P. Sprengel, F.R.S., the inventor of the mercury air-pump which bears his name, died on Sunday, at seventy-two years of age.

A MEMORIAL to the late Dr. George Salmon, F.R.S., Provost of Trinity College, Dublin, was unveiled on Friday, January 5, in the national cathedral of St. Patrick's, with which Dr. Salmon was officially associated during the best years of his life. An account of the ceremony appeared in the *Kensington Express* of January 5, from which we learn that the memorial consists of two windows in St. Peter's Chapel, the work of Mr. C. E. Kempe, depicting scenes in the career of St. Peter, and a medallion of Dr. Salmon, by Mr. A. Bruce-Joy, with a Latin inscription of which the following is a translation:—

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"That the name of George Salmon may abide in the memory of mankind this monument has been erected by his faithful friends and grateful pupils. Fellow of Trinity College, Dublin—afterwards Regius Professor of Divinity, and finally Provost, he was for thirty-three years Chancellor of this Cathedral Church. A mathematician both adroit and powerful, he probed with keen insight the beginnings of Christian history, and specially the origin of the New Testament Books; as teacher and counsellor he was unwearied in the service of the Irish Church. Shrewd, courteous, serious, kindly. He was born in 1819, and died in 1904. The fear of the Lord is the distinction of wisdom, and before honour is humility."

A GIFT of 1000*l.* has been received by the Royal Botanic Society from a fellow of the society, Dr. Robert Barnes.

THE widow and children of the late Dr. von Siegle, of Stuttgart, have presented 50,000 marks in memory of the deceased to the chemical institute of the University of Tübingen.

PROF. EMIL FISCHER has been elected president of the German Chemical Society for this year. Prof. S. Gabriel, Berlin, and Prof. W. Städel, Darmstadt, have been appointed vice-presidents in succession to Profs. O. N. Witt and H. Caro, who are retiring, whilst Drs. F. Mylius and A. Bannon have undertaken the duties of the secretaryship in succession to Drs. C. Schotten and W. Will. The post of librarian to the society, which hitherto has been held by Prof. Gabriel, has yet to be filled by the president. The society's funds are estimated at 762,635 marks, whilst the A. W. von Hofmann fund has nearly reached 45,000 marks.

AT Christiania on December 29, 1905, there gathered together under the presidency of Mr. John Sebelien a number of men interested in questions of agriculture and scientific subjects to celebrate the acquisition of a national independence in the past year. A fund was opened for the purpose of fostering research in the subject of Norwegian agriculture, to which fund all Norwegians, both at home and abroad, are invited to subscribe. When the sum of 15,000 kr. (833*l.*) has been subscribed, it is proposed to invite prize essays on particular questions, and to reward Norwegian scientific work in certain branches of learning; and later still it is intended financially to aid research work in agricultural science directly.

A REUTER message from Naples states that on January 10 three streams of lava were pouring down Vesuvius on the side upon which is situated Cook's funicular railway. The railway was seriously damaged, and the lava had reached the lower station. At the same date Etna was also active, a large amount of volcanic ash being ejected from the principal crater.

THE Geological Society of London will this year make the following awards of medals and funds:—Wollaston medal to Dr. Henry Woodward, F.R.S.; Murchison medal to Mr. C. T. Clough; Lyell medal to Prof. F. D. Adams, of Montreal; Prestwich medal to Mr. W. Whitaker, F.R.S.; Wollaston fund to Dr. F. L. Kitchin; Murchison fund to Mr. H. Lapworth; Lyell fund to Mr. W. G. Farnsides and Mr. R. H. Solly; Barlow-Jameson fund to Mr. H. C. Beasley.

DURING this month and next an exhibition of studies and effects obtained by current methods of colour photography will be open at the office of the *British Journal of Photography*, 24 Wellington Street, Strand, W.C. The

aim of the exhibition is to show results produced without the intervention of half-tone blocks, or the aid of printing machines. Flower and fruit studies, portraits, and landscapes are represented by three-colour prints produced by various processes, and among the subjects of transparencies are stained glass windows, diffraction grating spectrum, micro-organisms and crystals, butterflies, and a Lippmann spectrum.

We learn from the *British Medical Journal* that an international exhibition will be held under the patronage of the King of Italy at Milan on the occasion of the opening of the Simplon Tunnel. It will include a section of hygiene embracing general hygiene, public health, sanitary services, rural and industrial hygiene. The exhibition will be open from April to November. The third International Congress of Medical Electrology and Radiology will be held at Milan on September 5-9. Information as to membership may be obtained from Dr. Herschell, 36 Harley Street, London, W.

THE *Weekly Weather Report* of the Meteorological Office for the current year, which commenced with the issue of the report for the week ending Saturday, January 6, on Thursday last, has some novel features. The verbal description of the week's weather is placed in a more prominent position on the front page, and a table of the accumulated temperature, rainfall, and sunshine in the various districts for the aggregate of weeks from the commencement of the current season, winter, is given, in addition to the usual tables for the week and the aggregates from the commencement of the calendar year. In the table of detailed statistics for stations the groups of names included in the meteorological districts are subdivided to facilitate the compilation of values for the divisions of the country adopted for agricultural purposes by the Board of Agriculture. There is no change in the part of the report devoted to the daily summary of weather over Europe, but at the end, in place of the tables of addenda and errata, there appears an entirely new table of observations in the upper air. The first issue includes the observations by Mr. W. H. Dines at Oxshott on the 3rd, 4th, and 5th of the month, the days of international cooperation, and those of a kite ascent by Mr. C. J. P. Cave at Ditcham Park on the first day of the year. The last disclosed a remarkable temperature inversion, obviously in the region of junction between an eastern and western supply of south-easterly wind over the British Islands as shown on the maps. The juxtaposition of these observations and the maps showing the distribution of pressure over Europe make the inclusion of the week's results for the upper air in the report a very interesting feature, and it is to be hoped that in succeeding weeks the new development may be as fortunate as in its first number.

THE *Times* of January 6 contained an interesting account of despatches which have been received from the American travellers Mr. R. L. Barrett and Mr. Ellsworth Huntington, who are conducting an expedition in the Tarim basin. The explorers have fully studied some of the river systems between Khotan and Keriya, and made additions to our knowledge of the Tarim basin which bring out the striking resemblance of the basin to an inland sea. The examination of the ruins of abandoned villages appears to have thrown a good deal of fresh light on the gradual desiccation of Central Asia within historic times.

IN the issue of NATURE for August 13, 1903 (vol. Ixviii. p. 347), an illustrated account was given of the tetrahedral cell kites designed by Dr. A. Graham Bell. We learn

from a Canadian contemporary, the *Halifax Herald*, that Dr. Bell thinks he is a step nearer the attainment of his ambition to perfect a flying machine based on the tetrahedral kite principle. A new kite, constructed of 1300 tetrahedral cells, having a total area of 752 square feet of silk, making a supporting surface of 440 square feet, carried to a height of 30 feet, in a recent trial, not only its own weight of 61 lb., but also a load comprising flying lines, dangling ropes, and a rope ladder, making 62 lb. more, together with a man weighing 168 lb., a total altogether of 291 lb.

IN the *Engineering and Mining Journal* of New York of December 23, 1905, there is a reproduction of the selected design for the United Engineering Building, the building presented by Mr. Andrew Carnegie to the American Institute of Electrical Engineers, the American Society of Mechanical Engineers, the American Institute of Mining Engineers, and the Engineers' Club. The site has a frontage of 125 feet and a depth of 100 feet. The contract for construction was signed in July, 1905, and the contract limit is fifteen months to the date of expected completion. The building will serve the convenience of the four societies mentioned, and is also to furnish accommodation for other societies that have engineering or some other department of science as their principal object.

THE disaster at Charing Cross Station at 3.30 p.m. on December 5, 1905, caused by the sudden snapping of the tie-bar in the truss next to the wind-screen at the southern end of the station has caused much perturbation in engineering circles, and is dealt with at considerable length in the engineering journals. An excellent illustrated description of the roof is given in the January issue of the *Engineering Review*, and photographs of the fracture of the tie-bar are given in the *Engineer* and in *Engineering* of January 12. The tie-bar was nominally 4½ inches in diameter, and it was found that at the point of fracture there was an imperfect weld, the iron having been united properly over only about one-third of the section, so that the stress at that point was three times as great as it was designed to be. In fact, it was more than this, for the sound metal, being at one side of the line of tension, was subject to a bending force, and the state of affairs was somewhat similar to a notched bar under bending stress. The verdict given at the coroner's inquest on January 8 was to the effect that the accident was due to the breaking of the tie-rod through an unforeseen flaw, and that no blame was attached to any of the railway company's officials.

WE have received a copy of part v. of the "Marine Fauna of Ireland," published by the fisheries branch of the Irish Department of Agriculture, in which Mr. W. M. Tattersall discusses the isopod crustaceans. Some difficulty has been experienced in getting a good series of these creatures owing to the fact that the majority are not pelagic, and are, therefore, not taken in tow-nets. Nevertheless, the author describes no less than ten species as new, half of which are made the types of new genera, while one is regarded as representing a new family.

AMONG the numerous and varied contents of the *Proceedings of the Indiana Academy* for 1904, attention may be directed to a remarkably fine series of photographs of the nests and eggs—in some instances also the young—of a number of the birds of the district in their natural surroundings. Two of these are of special interest as showing the nest of the little green heron, first with eggs and then with the downy young. In many cases great difficulty

must have been experienced in getting the camera into position, and in some instances the whole side of a tree-stem has been cut away in order to show the eggs. Indian ceremonies form the subject of several articles at the close of the volume.

In the course of an account of the Hastings Museum, Worcester, published in the December (1905) issue of the *Museums Journal*, the curator, Mr. W. H. Edwards, takes occasion to emphasise the extreme importance of the development of local collections. "If there are among my hearers," he observes, "any who are in the happy position of having charge of a newly started museum may I strongly urge them to make their local, or county collections, in all branches, as complete as possible, as no opportunity should be lost in acquiring specimens which have any bearing on the past history of a district." These views accord with those that have on more than one occasion been advanced in our columns. In a second article in the same issue it is somewhat amusing to find an author urging that a proposed new institution should be, as regards the exhibited series, "unlike ordinary museums, where, as far as possible, every species, and even varieties, are represented." In how many museums, "ordinary" or otherwise, is such a series displayed, and where is there one which would hold it?

THE whole of parts iii. and iv. of vol. xxxiv. of Gegenbaur's *Morphol. Jahrbuch* are occupied by a long essay on the tympanic region of the mammalian skull, by Dr. P. N. van Kampen, of Amsterdam. The article is an expansion of an address delivered by the author in Amsterdam in 1904. Within the space of a brief paragraph it is quite impossible to do justice to its contents, and it must in the main suffice to direct the attention of those interested in the subject to the mine of information it contains. It is interesting, however, to note that the author regards the primitive condition of the mammalian tympanum as consisting of a small and often incomplete ring, with, at most, an imperfect ventral wall to the tympanic cavity, and that a close approximation to this condition is presented by *Ornithorhynchus*. The tympano-hyal is the characteristic mammalian element in this region, but the ento-tympanic is also regarded as peculiar to the group, and unrepresented among the lower classes. As regards the tympanum itself, the author considers it to be a special development from one of the elements—probably the supra-angular—of the reptilian compound lower jaw. The features presented by the region are held to be of considerable value in classification.

THE Carnegie Institution of Washington has published a volume of 193 pages, by Profs. W. O. Atwater and F. G. Benedict, giving a description of a respiration calorimeter with appliances for the direct determination of oxygen. The apparatus has been in process of development for twelve years, and has been designed with a view to a proper understanding of the metabolism or transformations of matter and energy in the body, by obtaining a knowledge of both total income and total outgo. After describing the calorimeter and the methods adopted for the calculation of results, the experiments with man are considered. Since the completion of the new apparatus, twenty-two experiments with five different subjects, covering a total of sixty days, have been conducted. These experiments lasted from one to thirteen days, during which time the subject remained enclosed in the calorimeter chamber. In general, each experiment was pre-

ceded by a preliminary period outside the chamber, during which the subject was given the special diet to be tested, and his habits of life were so modified as to conform with those to be followed in the chamber. The following determinations of intake and output of material were made in the experiments:—The intake consists of food, drink, and oxygen from respired air. The amounts are determined by weighing. The output of material consists of products of respiration and perspiration, urine, and faeces. In the measurement of intake and output of energy the intake is derived from the potential energy, i.e. heats of combustion of the food. The output consists of sensible heat given off from the body, the latent heat of the water vapourised, and the potential energy, i.e. heat of combustion of the unoxidised portions of the dry matter of urine and faeces. In certain cases, e.g. work experiments, a portion of the output is in the heat equivalent of external muscular work.

IN the *Bulletin du Jardin impérial botanique* of St. Petersburg, vol. v., part iv., Mr. N. Busch describes a new Aconite, section Napellus, and a new Delphinium. Both plants were grown in the garden from seed collected in Tibet by Mr. W. T. Ladygin. A list of the known species of Iris from Turkistan is contributed by Mr. and Mrs. B. Fedtchenko, including several new species all belonging to the section Juno.

DR. B. M. DUGGAR, formerly a member of the scientific staff of the United States Department of Agriculture, has for some years been experimenting on better methods of propagation of mushrooms than the present chance method depending upon natural virgin spawn. His latest results are published in Bulletin No. 85 of the Bureau of Plant Industry. No more certain method for germinating the spores has been devised than that discovered by Dr. Margaret Ferguson of adding a portion of mycelium to the culture; but the latest experiments proceed on a new line of producing virgin spawn from pure cultures. A portion of the inner tissue of a young selected mushroom is transferred to a sterilised compost in tubes, and the mycelium produced in this way under pure culture conditions is sown on bricks of manure.

TWO recent numbers of the *Transactions of the Academy of Science of St. Louis* deal with botanical subjects. In vol. xiv., No. 7, Mr. B. F. Bush presents a summary of the species of *Tradescantia* from Texas, in which he adopts the view that certain forms referred to *Tradescantia virginiana*, notably *Tradescantia reflexa*, should rank as independent species. In vol. xv., No. 1, Dr. L. Wittmack writes on our present knowledge of ancient plants. He mentions that some of the wheat found in Egyptian sarcophagi and in Asia Minor shows the characters of the wild grain, and that the barley is of the variety *hexastrichum*, having six rows in the ear. From Peruvian sepulchres two kinds of bean have been identified as the Lima bean, *Phaseolus lunatus*, and the French or haricot bean, *Phaseolus vulgaris*. The author pronounces in favour of American origin for the latter.

IT will be known to readers of NATURE that one of the principal objects before the botanical congress held in Vienna last June was to formulate satisfactory laws for regulating systematic botanical nomenclature. A concise account of the main questions under dispute, and of the alternative suggestions put forward, is given by Dr. H. Harms in *Naturwissenschaftliche Wochenschrift*, December 10, 1905. There were three principal points of contention,

these being the earliest date for reference of priority, the extent to which priority of genus name should be observed, and how priority of specific name is to be decided. The year 1753, in which Linnaeus first established his system of binomial nomenclature, was accepted as the critical date; the difficulty with regard to genera was settled by the confirmation of a list of names that are too well established to be superseded, while the decision in the matter of specific names was a compromise between the German practice of adopting the earliest name and the Kew rule that favours the first correct binomial.

THE growing of Egyptian and other varieties of cotton is, says a writer in the *Pioneer Mail*, being carried on steadily in Upper Sind. It is indicative of the difficulty of forecasting the future of a transplanted variety that "Iannovitch," the finest of the Egyptian varieties, but regarded as the most delicate of those experimented with, has suffered the smallest amount of deterioration in staple from the quality of the Egyptian grown product, and that Mitaffifi, which is considered the most robust, has shown the greatest amount of deterioration. The general results must, however, be considered as satisfactory in yield as compared even with the Egyptian crop, and by the figures the best Egyptian variety should prove 250 per cent. more profitable to the cultivator than the indigenous Sindhi variety.

ACCORDING to a writer in the *Journal of the Society of Arts*, the rubber industry continues to expand rapidly. The imports of rubber last year were exceptionally large, and throughout 1905 the price was better than in the preceding year. It may be expected that before very long the supply will be ample for all demands. Not only are there immense tracts of rubber which remain untouched in Liberia and elsewhere, but the cultivation of the rubber tree is being rapidly extended. Java, for example, is planting extensively, and within the next six or eight years the exports from that island are likely to be very large. In Ceylon, too, and the Malay Peninsula, considerable tracts of country are being planted with rubber. The way in which the tree adapts itself to the various climatic conditions obtaining in different countries is almost unique in tropical cultivation.

OF the life of a born naturalist no better example could be given than the account of the late Prof. Federico Delpino contributed by his pupil Borzi to the *Atti dei Lincei*, xiv. (2), 9. Born at Chiavari (Liguria) on December 27, 1833, Delpino's delicate state of health resulted in his spending much of his early life in a garden, where he soon became absorbed in observing ants, wasps, and flowers. In 1850 he commenced, by his own choice, a course of mathematics at the University of Genoa, but his love of botany prevailed, and he determined to make that subject his life work. After a sea voyage to the east, which gave him an opportunity of making a collection of the flora of the Dardanelles, he was employed in office work under the Minister of Finance at Turin, and later (1865) at Florence, where he soon resigned his post to take a subordinate assistant's position in the botanical museum. Four years later he was appointed professor at the school of forestry at Vallombrosa, and in 1875 he became associate professor of botany at Genoa. Later he held appointments at Bologna and Naples. He died on May 14 of last year. Delpino, who was entirely self-taught, became one of the pioneers in the study of vegetable biology. He was an ardent opponent of Darwinism, although a study of Darwin's work on orchids led to his first paper on fertilisation of the Asclepiadaceæ, published in 1865. Other

important contributions dealt with the relations between plants and insects, particularly ants, and several of his results were confirmed by the observations of Belt in Nicaragua. In botanical geography he published writings on the distribution of the Ranunculaceæ, and on the relations between Arctic and Antarctic flora. Several of his writings have been mentioned in the "Notes" columns of NATURE up to quite recently. Another account of his life is given in the *Rendiconto* of the Naples Academy for May and June, 1905, and differs in one or two points of biographical detail from the preceding one.

WE have received a copy of the twelfth annual report of meteorology in Mysore, for the year 1904, compiled by Mr. J. Cook, director of the service. It includes the results obtained at the observatories of Bangalore, Mysore, Hassan, and Chitaldrug, with diagrams showing the range of the principal elements; also mean values for the twelve years 1893-1904. The data for this important Indian area are very carefully worked up, and the volume contains a large amount of valuable statistics.

THE tides of the North Sea have within recent years been the subject of investigation by Mr. J. P. van der Stok, and the results have been published in three papers by the Netherlands Meteorological Institute, "Études des Phénomènes de Marée sur les Côtes Neerlandaises" (Utrecht: Kemink & Zoon, 1905). The first of these papers consists of an analysis of the variation in the level of the sea. The second deals with the results of observations, made on board the Netherlands lightships, of the tidal currents; and the third contains a table of these currents, the corresponding velocity and direction of the wind at five different stations, and the date of the new and full moon for every month up to 1952. Mr. Stok more particularly directed his investigation to the horizontal movement of the water and the rotatory currents in the North Sea. There are two subjects in connection with the tides of the North Sea that more particularly require consideration—the effect of the tidal wave of great length moving along the coast inclined to the direction of its propagation; and why the wave that comes from the north-east of Shetland is propagated principally along the coast of Scotland. This, he suggests, is due to the rotation of the earth. Mr. Stok considers that the tides of the North Sea are well worth the attention of physico-mathematicians interested in hydrodynamics, as they afford a model for the study of the mechanics of the tides.

IN a paper on fluorescence (*Journal de Physique*, December, 1905), M. G. Camichel deduces from experiments and theoretical reasoning connected with them that the coefficient of fluorescence of a fluorescent substance remains constant during the period of fluorescence, at any rate under the conditions of the experiments.

IN the *Journal de Physique* for December, 1905, MM. Bouasse and Berthier discuss the elongation of wires by flexion, in particular in connection with the property that a wire which is incapable of being elongated more than 0.1 per cent. by simple traction can be lengthened by as much as 10 per cent. or 20 per cent. by bending. Observations of the changes of microscopic structure, as well as of the torsional rigidity of the wire at various stages of the processes, seem to indicate that this discrepancy is attributable to want of homogeneity in the wire, the effects of which disappear when the deformation is made to take place point by point along the wire.

IN the *Bulletin des Séances* of the French Physical Society, M. E. Haudié gives a brief illustrated account of

the method of determining the magnification of an astronomical or Galilean telescope by photography. The telescope is placed in front of a camera pointed at a distant object (a church spire), and measurements of the telephotograph thus obtained, as compared with the picture obtained with the camera alone, give the magnification.

Of the many important topics discussed in the *Economic Journal* for December, 1905, we find a note of eight pages on political economy in Germany, by Prof. G. Cohn, of Göttingen. In it we learn that thirty or forty years ago there were two schools of political economy, namely, on the one hand, the Free Traders, whose science was confined to a few very elementary principles and who appealed to the people, and, on the other hand, the economic teaching of the universities. At the present time the universities, strengthened by the high degree of freedom which their professors enjoy, play an important and ever-increasing part in determining public opinion on economic questions throughout the Empire. Indeed, the author concludes:—"We do not claim too much for our German Political Economy and our German Universities when we say that the spirit which rules them is as wide and many sided as it is active and far seeing."

FROM the point of view of the disintegration hypothesis of the nature of radio-activity, a brief note by P. G. Costanzo in the *Bulletino Mensuale* of the Italian Meteorological Society (vol. xxiv., p. 25) is of interest; it is stated that several lavas and solid deposits from Vesuvius and the solfatara of Pozzuoli which, on examination, were found not to exhibit any sign of radio-activity were equally destitute of any trace of helium.

FOR his inaugural address, delivered on November 22 of last year, Prof. R. Threlfall, as chairman of the Birmingham section of the Institution of Electrical Engineers, chose the subject "Some Problems of Electro- and Electrothermal Chemistry." The principal question dealt with was the conversion of carbon into the "non-conducting" variety, and Ludwig's recent attempts to produce diamonds on the large scale were discussed, principally by considering theoretically the probable conditions governing the inter-conversion of the various forms of carbon. Other subjects touched upon included the fixation of atmospheric nitrogen, the ionic theory, and the use of osmium and tantalum in incandescent lamps.

THE final number (No. 7) of the second volume of the *Central*, the magazine of the Old Students' Association of the Central Technical College, well maintains the high level of its predecessors. It contains a photogravure of Prof. Ayrton, president of the association, whilst a special feature is the large number of photographs illustrating the articles contained in it. Of these articles we may mention an interesting account by Mr. A. A. Barnes of the work recently carried out in excluding the Nile from two of its three channels at Ashmant for purposes of land reclamation; a summary by Prof. Armstrong of the various researches made on camphor at the college during the past twenty years, indicating the widely ramified growth of the problem; and a description of several types of electro-magnetic ore crushers by Mr. C. J. Guttmann. Two photographs of a new camphor-model illustrate Prof. Armstrong's article.

A BRIEF note by F. Giolitti in the *Gazzetta* (vol. xxxv. p. 181) contains some interesting particulars with regard to the coagulation of colloidal solutions of ferric hydroxide, the observations forming an extension of the earlier ones of Péan de St. Gilles. Whereas a trace of any polybasic

acid, for example sulphuric acid, added to the colloidal solution obtained by boiling ferric acetate with water instantly precipitates a flocculent "hydrogel" which is insoluble in water, a considerable quantity of a monobasic acid such as nitric acid has to be added to the colloidal solution before a precipitate is produced. The product in this case is a reddish powder which re-dissolves in pure water, and is hence a "solid hydrosol." The quantity of monobasic acid necessary for complete precipitation of the solid hydrosol appears to be fairly definite for a definite set of conditions. The character of the colloidal solutions of a substance, however, seems to depend very largely on the way in which they are prepared. Thus a solution of ferric hydroxide prepared by dialysis according to Graham's method gives on coagulation very different results from those obtained with the solution prepared from ferric acetate. Moreover, other colloidal solutions, such as those prepared from ammonium uranate, plumbic acid, and silicic acid, have certain features which characterise their coagulation. It seems necessary, indeed, in considering the general question of colloidal solution, to recognise that several distinct types of coagulation exist.

THE adhesion of electrical contacts in delicate seismoscopes continues to exercise the minds of Italian seismologists. No other form of seismoscope can be made so sensitive as one which records electrically, but the force tending to separate the contacts is so small that the circuit sometimes remains closed. In the concluding number of vol. x. of the *Bulletino della Società Sismologica Italiana* Dr. Agamennone reviews all the devices which have been proposed to overcome the adhesion, and concludes that the only efficient one is that suggested by Dr. T. Alippi, of attaching a vibrator to the seismoscope, which shall act like the decoherer in wireless telegraphy, but adds that his experience in the observatory at Rocca di Papa shows the necessity of carefully adjusting the energy of this vibrator. If too energetic it may produce the very evil it is designed to cure.

THE annual report of the Iowa Geological Survey has just been published at Des Moines under the able editorship of Dr. F. A. Wilder, the State geologist. It deals with the year 1904, and forms a handsome quarto volume of 560 pages with 10 folding coloured geological maps of counties, 7 plates, and 51 illustrations in the text. In addition to the State mineral statistics for 1904, and reports on the geology of Benton, Emmet, Palo Alto, Pocahontas, Jasper, Clinton, and Fayette counties, the volume contains an important report on the Portland cement industry and Iowa's natural resources with reference to that material by Mr. E. C. Eckel and Mr. H. F. Bain. The report shows plainly that the limestones and clays of Iowa are well suited for the careful study of the cement manufacturers. Despite the large amount of material available and the convenient fuel and transportation facilities, no Portland cement plants have yet been established in Iowa, although a number are in operation in adjacent States.

WE have received from the Home Office an advance proof, subject to correction, of the statement of fatal accidents and deaths in and about the mines and quarries of the United Kingdom during 1905. The total separate fatal accidents were 955 in collieries, 41 in metalliferous mines, and 94 in quarries.

MR. WILLIAM HEINEMANN has in hand, under the title of "A Handbook of Metabolism," an English translation of the second German edition of von Noorden's "Lehrbuch des Stoffwechsels," edited by Dr. Walker Hall, of Manchester.

WITH the title the *Australian Journal of Science*, a new periodical edited by Prof. Liversidge, F.R.S., is to appear during the present month. At first the journal will be issued monthly, but afterwards, if it meets with sufficient support, at more frequent intervals. Literary correspondence, and publications for review, should be addressed to the Editor, *Australian Journal of Science*, The University, Sydney.

THE thirty-third annual dinner of old students of the Royal School of Mines will be held on Friday, February 16, at the Hotel Cecil. The chair will be taken by Prof. S. Herbert Cox; and the opportunity afforded by the dinner will be taken to make a presentation to Prof. J. W. Judd on his retirement from the chair of geology. Subscriptions for this testimonial should be forwarded before the end of January to Mr. D. A. Louis, 77 Shirland Gardens, W., to whom applications for tickets for the dinner should also be sent.

THE publication by Mr. George A. Morton, of Edinburgh, at 3s. 6d., of an attractive edition of Hugh Miller's "My Schools and Schoolmasters" should serve to re-direct attention to the work of a geologist whose writings were in the middle of last century the means of attracting many persons to the study of natural phenomena. A biographical introduction to the volume by Mr. W. M. MacKenzie provides an interesting study of Hugh Miller's career as stonemason, bank clerk, editor, geologist, and author, and reminds the reader that this work of his was published in 1854. The stonemason who by his own unaided efforts could attain to such an acquaintance with the rocks of his native land as to become the author of "The Old Red Sandstone" should prove an encouragement to all students of science who are working in the face of great difficulties. This new re-issue deserves a wide popularity.

A BOOKLET by Mr. J. El. David entitled "Le Tunnel du Simplon" has been published by Messrs. Payot and Co., of Lausanne. Parts of the account have already appeared as articles in the *Gazette de Lausanne*. In view of an article which appeared in NATURE of November 9, 1905, p. 30, describing survey work of the Simplon Tunnel, it is unnecessary to do more than refer to the contents of the brochure. Before publication the text was submitted to the chief engineers in charge of the work, so that the book may be read with confidence as containing a correct account of the order of events. The biographical notices and portraits of the engineers in charge of the gigantic undertaking, and other numerous illustrations, add greatly to the value of this essay.

OUR ASTRONOMICAL COLUMN.

COMET 1905c (GIACOBINI).—A new set of elements and an ephemeris for comet 1905c appear in No. 88 of the Lick Observatory Bulletins; they have been computed by Mr. R. T. Crawford, of the Berkeley astronomical department, and the elements are as follows:—

$T = 1906 \text{ Jan. } 22^{\text{nd}} 1845 \text{ G.M.T.}$

$$\begin{aligned} \infty &= 199^{\circ} 1' 28'' \\ &= 92^{\circ} 2' 00'' \\ i &= 43^{\circ} 38' 36'' \\ \log q &= 0.217605 \end{aligned}$$

The ephemeris shows that after perihelion (January 22) the comet's brightness will decrease rapidly, falling from 58.6 on that date to 22.7 on January 30. The positions (true) are given for alternate days during January, but only the three given below have been computed for dates subsequent to January 28:—

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Ephemeris oh. G.M.T.			
1906	α (true) h. m. s.	δ (true) " "	Brightness
Jan. 30 th	21 53 28	- 25 44 25	22.7
Mar. 1 st	1 48 11	- 6 2 44	1.5
April 2 nd	3 29 3	+ 7 9 50	0.3

Numerous observations of this comet are recorded in No. 4065 of the *Astronomische Nachrichten*. Dr. Jost, observing at Strassburg on December 30, 1905, found that the magnitude was about 5.0, and that the comet had a sharp definite nucleus and a tail about 3° in length. On January 1 the magnitude was 4.0-5.0, the diameter of the nucleus 4", and the length of the tail about $1\frac{1}{2}$.

A daily ephemeris, extending from January 13 to January 31, is given by Herr E. Strömgren in the same journal.

NEBULOSITY AROUND NOVA AQUILÆ.—Prof. Frost reports that a careful examination of the photographs of Nova Aquilæ No. 2, taken with the Bruce telescope at Arequipa on October 16 and 21, 1905, shows the Nova to be surrounded with a faint nebulosity nearly circular in form and extending to about 0'.4 on each side of the star. The exposure in each case was 120 minutes, and the nebulosity was independently confirmed by Mr. Manson.

As no such nebulosity appeared on the engraving given in vol. xxii. (p. 269) of the *Astrophysical Journal*, representing the Nova on September 21, 1905, Prof. E. C. Pickering suggests that it radiated from the Nova early in October, as was the case in Nova Persei No. 2. He points out, however, that, if it can be shown that the spectrum is peculiar, the apparent nebulosity on the Bruce photographs may be explained as being due to chromatic aberration which does not exist in the reflector, and would therefore not affect the earlier photograph (*Astronomische Nachrichten*, No. 4065).

THE FIGURE OF THE SUN.—Continuing his research on the variable figure of the sun, Dr. C. L. Poor has reduced the values of the solar diameter obtained by Schur and Ambron, with the 6-inch Repsold heliometer of the Göttingen Observatory, during the thirteen years 1890 to 1902.

A detailed description of the methods of reduction is given in No. 5, vol. xxii., if the *Astrophysical Journal*, and the results tend to confirm those obtained in Dr. Poor's previous research, viz. that the ratio between the polar and equatorial radii of the sun varies periodically, the period being nearly the same as that of sun-spots. The amplitude of the variation is about 0".2, the greatest difference between the extreme values of the quantity (polar-equatorial diameter) being 0".5.

STELLAR MAGNITUDE OF THE SUN.—The results of an interesting research made by Prof. Cerasaki at Moscow on the relative magnitudes of the sun and Polaris, Procyon, and Sirius, are given in No. 4065 of the *Astronomische Nachrichten*. During the day Prof. Cerasaki photometrically compared the light received from Venus with that obtained from a reflected image of the sun, and then at night compared Venus with the stars named.

As a result he found that the sun sends us 290550×10^6 times more light than Polaris, 77630×10^6 times more light than Procyon, and 17045×10^6 more than Sirius. Taking the magnitudes of these stars as 2.15, 0.56, and -1.09 respectively, this gives -26.51, -26.66, and -26.67 as the stellar magnitude of the sun, and the weighted mean value becomes -26.59. As Prof. Cerasaki objects to the obvious paradox in assigning a negative value to the sun's magnitude, he omits the minus sign and gives his result as "26.59 super magnitude."

VARIABILITY OF IRIS.—The results of a number of photometric measurements of the apparent brightness of Iris, carried out by Dr. H. Clemens during February and March, 1904, are given in No. 4063 of the *Astronomische Nachrichten*.

The lowest magnitude was recorded at 10h. 15m. (M.E.T.) on March 28, and was 10.34; the highest maximum observed (8.80) took place on February 9 at 8h. 46m. From the consideration of his results, Dr. Clemens concludes that Iris has a real variation of magnitude amounting to 0.25m.-0.30m., and having a period of approximately four hours.